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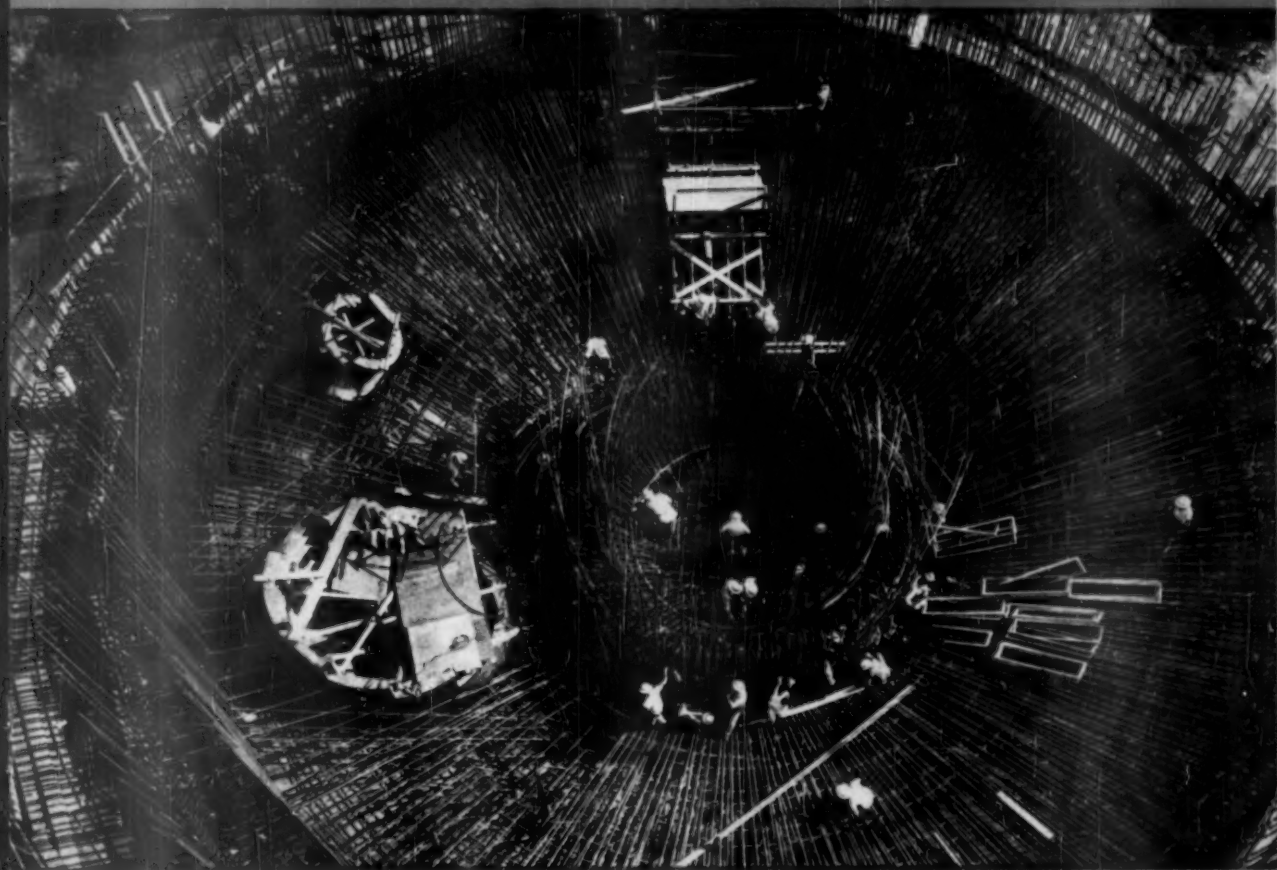
January 24, 1959

VOL. 75 NO. 4

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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Steel for A-Power

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DEMOGRAPHY

Need Population Control

The seriousness of the current population upsurge poses a problem for biological and social scientists, particularly in the underdeveloped nations of the world.

► THE DAY may come when individuals will no longer have the right to determine how many children they will bear, without regard to biological and cultural consequences, Dr. George W. Beadle, geneticist and 1958 Nobelist in medicine and physiology, suggested as a result of the development of knowledge about heredity and genetics and the growth of world population.

Dr. Beadle, chairman of the California Institute of Technology's biology division, speaking at a Resources for the Future forum, said that decisions must be made about man's genetic future because:

Genetic knowledge we have attained "can be applied to directing our own evolutionary futures," but we shall "fail miserably unless it is done with more wisdom than so far demonstrated."

"With present rates of population growth, something will have to happen before too many generations." Questions to be answered "will go far beyond science in their implications." (See p. 54.)

"Genetics will have a great deal to say about such things as the necessity of genetic

diversity in populations, the biological consequences of interpopulation mixing and the effect of mutation rates that will result if exposure to artificial radioactivity is significantly increased over its present levels."

Dr. Beadle predicted that biochemists may, before long, be able to duplicate in test tubes the conditions under which "living" molecules arose on earth a few thousand million years ago.

Citing the recent discoveries that deoxyribonucleic acid (DNA) is the primary genetic material, in viruses and probably in animals including man, Dr. Beadle told how this new knowledge of the stuff of the genes fills important gaps in our understanding of evolution.

Life can now be defined in objective terms, Dr. Beadle observed, as ability to replicate in the manner of DNA (duplication of molecules in the image of the original one) and to evolve through mutation (change of the genes) and natural selection.

Former vice president Henry A. Wallace, whose development of hybrid corn was

largely responsible for adding within a few years at the end of the thirties 20% or 500,000,000 bushels to the American corn crop without adding labor or acres, declared in discussion of Dr. Beadle's paper that:

"Complete chemical and biological understanding of DNA and the chromosomes will sooner or later shake our social, political and religious life even more profoundly than the atomic bomb."

Mr. Wallace suggested hereditary and health records will in the future be kept of all the people of the world, listing diseases, death causes, intellectual attainments, abnormalities, the blood types of each person by families. These would not be used by a genetic Hitler, but would allow choice of marriage partners to avoid hereditary disease.

Population Boom

Mr. Wallace observed that world population now increases at the rate of 48,000,000 a year and probably 30,000,000 come from areas where the income per capita is less than one-tenth that of the United States and where illiteracy is more than 50%. These millions in the future will become the most powerful political force in the world.

The population explosion in the long run threatens Russia more than the United States, Mr. Wallace believes. He is more concerned with the increasing lack of opportunity for these rapidly breeding people to demonstrate productivity in hope and joyous living than he is about possible inferior genetic quality.

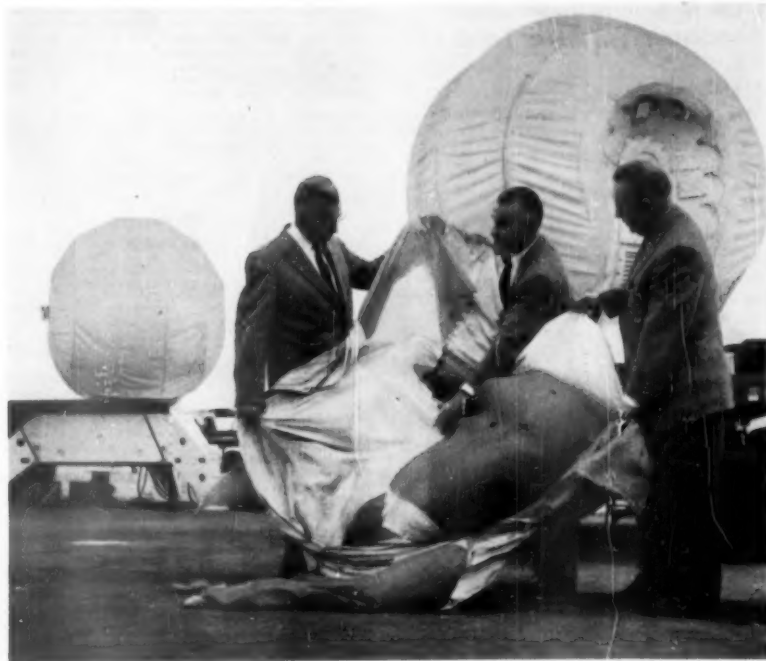
The wonders of human growth were described by Dr. Beadle as follows:

"It is an unending source of wonderment that out of minute spheres of jelly-like protoplasm little larger than the point of a dull pin there should develop living beings like you and me—beings built of uncountable billions of molecules intricately organized and interrelated; capable of growth, adaption, memory, rational thought and communication; able to create and appreciate art, music, literature, religion, science and technology; and, above all, designed to hand down to the next generation the biological and cultural inheritance that permits this near-miracle to be repeated again and again. All this from the tiny cell that is the fertilized egg of man.

Secret of Life

"If we could but expose the secrets that lie locked within this minute sphere, we would have achieved complete understanding of man, including the manner of his origin from subhuman ancestors and the nature of his destiny in an evolutionary future now unknown. Not in your time or mine, nor in the time of our sons and grandsons, will we succeed in doing this. But still the progress of modern science has been so great in this direction in recent years that it is now possible to redefine some of the most basic concepts of biology in terms enormously more meaningful than those used but a few years ago."

Science News Letter, January 24, 1959



MISSILE TARGET—A parachute served as target in the first test of the Nike Hercules' lethal capacity. The supersonic guided missile successfully intercepted and destroyed its target at an altitude of more than 20 miles. Bell Telephone Laboratories' scientists H. G. Och, R. W. Benfer and L. W. Morrison (left to right) examine bores in the 'chute.

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MEDICINE

Scanning Device Speeds Vaginal Cell Examination

► DETECTION of cancer of the uterus is now simpler and quicker due to a scanning device that can differentiate abnormal cell specimens.

The electronic device is called the Cyto-analyzer. It sorts specimens of vaginal fluid in cell examinations. Dr. John C. Pruitt of the National Cancer Institute reported at the annual meeting of the Inter-Society Cytology Council in New York.

The first clinical trial of the device produced successful results, the scientist said. In the current study, 1,075 negative slides and 20 positive or suspicious slides were fed into the machine.

About 40% of the known negative slides were correctly eliminated as totally negative. Thus, only those left would have had to be examined by cyto-technicians. None of the positive cases were missed by the machine.

The reduction of error in the electronic selection was accomplished by a new method of preparing vaginal-cervical specimens for machine scanning. This method allows the instrument to scan each cell and record the results.

This device is expected to play an important role in decreasing the death rate from uterine cancer.

Science News Letter, January 24, 1959

TECHNOLOGY

Old G.I. Snooperscope Becomes Science Tool

► THE CELEBRATED Army snooperscope, used to spot the enemy at night during World War II and the Korean conflict, has been modified into a simple, powerful research tool.

In its wartime application, the snooperscope sends out invisible infrared rays which are reflected back into the tube. The rays pass into an electronic converter which in turn shoots electrons against a phosphorescent screen, revealing the image of the enemy troops and equipment.

The modification allows scientists to use ultraviolet light to view living human tissues, chemicals and industrial materials otherwise impossible to see.

Although ultraviolet is not new to research, the device which has been named "Ultrascop" is believed to be the first providing direct visible focusing in the use of such rays.

Developed at the Radio Corporation of America's electron tube division, Lancaster, Pa., the Ultrascop has been tested by several outside researchers, including Dr. George Z. Williams of the National Institutes of Health clinical center near Washington.

Dr. Williams said the device could have innumerable applications in research in science and industry.

In the medical field, the Ultrascop allows scientists to see, among other things, individual chemicals and structures in human

cells and blood and protein changes caused by virus infections.

For viewing these same things, Dr. Williams now has a \$15,000 television set-up. It contains more than 100 electron tubes and is housed in a special laboratory with cooling equipment. The Ultrascop has a single tube, is kept in a four-cubic-inch box and costs about \$1,500.

The device, according to Dr. Williams, provides an image superior to that of the complex television. While the television picture is made of a series of lines, the picture in Ultrascop is more like that seen in the movies.

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PHARMACOLOGY

Drug Outclasses Morphine

A new pain-killing drug that appears to be more powerful, less addicting and safer than morphine has been developed by two scientists. They labeled it NIH 7519.

► A NEW PAIN-KILLING drug that appears to be ten times more powerful, less addicting and safer than morphine has been developed by scientists at the U. S. Public Health Service's National Institutes of Health.

The drug, labeled NIH 7519, is made from coal tar derivatives. It belongs to a new series of chemical compounds called benzomorphans.

NIH 7519 is reported to have pain-killing power at least ten times that of morphine and 50 times greater than codeine. The drug has been used on more than 200 human patients suffering severe pain. Delivery room and post-operative pain are the specific targets that the scientists said the new drug affected.

Dr. Everette L. May, laboratory of chemistry, National Institute of Arthritis and Metabolic Diseases, developed the drug in collaboration with Dr. Nathan B. Eddy, chief of the Institute's section on analgesics.

Scientists have been working for years to separate the pain-relieving and addicting characteristics in substances having potency as great as or greater than morphine. Numerous drugs have been produced, but

none proved useful. The newer drugs showed greater pain-killing results, but these were always coupled with greater addiction or other harmful effects.

Findings to date indicate that NIH 7519 is addicting too. But the exact degree is still to be determined, Dr. May pointed out.

The final cost of the new drug to the patient has not been determined. Dr. May estimated that it will range between intermediate and high-cost drugs. It will be available by prescription only, he emphasized.

This synthetic drug may prove to be extremely important because there is an acute world-wide shortage of opium for medicinal use, Dr. Eddy said. Opium is the source of morphine and other powerful pain-relieving drugs used in medical practice.

Iran and Afghanistan, big suppliers of opium, are trying to wipe out addiction. Hence, they have curtailed opium production. Turkey and India are now the only two legitimate producers of opium for medicinal needs.

Currently the drug is on clinical trial. Patients in Philadelphia, New York and

Los Angeles are receiving it under careful observation.

The drug was supplied to NIH by Smith, Kline and French Laboratories of Philadelphia. New York Quinine, Abbott Laboratories of North Chicago, Mallinckrodt Chemical Works, St. Louis, and Merck and Company of Rahway, N. J., are investigating the possibilities of producing the pain-killer.

Science News Letter, January 24, 1959

ENGINEERING

Atomic Reactor Structure Gets First Steel Layer

See Front Cover

► THE GIANT reinforced concrete structure that will house the nuclear reactor of the Yankee Atomic Electric Company power plant at Rowe, Mass., is beginning to take shape.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows construction forces of Stone and Webster Engineering Corporation placing 100 tons of reinforcing steel around the base of the concrete structure that will be enclosed in a steel sphere having a diameter of 125 feet. The reinforced concrete reactor structure, when completed, will have required 600 tons of steel and 12,000 tons of concrete.

The atomic power project, sponsored by ten New England utility companies is scheduled for completion in 1960.

Science News Letter, January 24, 1959

MEDICINE

Fluoroscopic Examination Of Heart Is Hazardous

► THE USE of fluoroscopic examination to diagnose heart disease is an unnecessary hazard, a cardiologist reports.

This diagnostic procedure exposes patients to as much as 1,000 times the radiation as standard X-ray methods, Dr. Eliot Corday, cardiologist at the University of California Los Angeles Medical School, says. Dr. Corday has written an editorial in the *American Journal of Cardiology* pointing out that, in addition, X-rays provide as much information as fluoroscopic examination, as well as a permanent record.

An average fluoroscopic examination may expose the patient to from 10 to 37 roentgens (radiation units) as compared to 0.002 roentgens for film procedures. The National Bureau of Standards has set maximum permissible doses for patients under 18 at 1.5 roentgens per year and for those over 18 at five roentgens annually.

The solution to the entire problem may be very near, Dr. Corday observes. The technique of X-ray movies, technically known as image cinerentgenography, is now nearly perfected. This technique offers a minimum of radiation exposure, and the heart specialist can review the movies over and over without any exposure.

For the present time, to limit radiation exposure, he advises that the use of fluoroscope be reserved for those patients revealing an abnormality on chest X-ray film.

Science News Letter, January 24, 1959



FISH RECEIVE MORE AIR—The widening stretch of open water increases the oxygen content of the lake. Air forced through a perforated polyethylene pipe by a Gardner-Denver compressor brings the relatively warm water up from the bottom of the lake to melt the ice. Oxygen content is increased by wind action on the open water and by the air bubbles themselves, resulting in more oxygen for the fish. The aerating system was created by Charlie Brown and Jack Scott of the White Rock Fish Club, Kilmar, Quebec.

ENGINEERING

Describe Car of 1980

► **THE AUTOMOBILE** of 1980 may be lighter, roomier, quieter, cheaper, more streamlined.

It will differ as much from the car of today as the car of today differs from its 1936 counterpart. Application of aerodynamic principles will make it more maneuverable at any speed and safer to ride in. This will mean continued use of tail fins for directional stability.

These were the predictions made by J. E. Charipar of the Plymouth Division of Chrysler Corporation at the Society of Automotive Engineers meeting in Detroit.

Mr. Charipar foresees tomorrow's car as having clean contours, with flush windows and ornamentation. Body surfaces may be extended like a skin all around the car, including the underside. Engines will be more powerful but lighter and smaller, affording more room for passengers and cargo. Improved road pavements will enable manufacturers to build cars with chassis clearances of as little as four or five inches.

Instead of sprayed-on surface paints, the car of 1980 may have a tinted oxide film coating, a "color-filled" metal surface that would never require polishing or repainting. Brake flaps may be used in the car of the future.

Increased use of glass and glass-like materials in upper body areas was also predicted by Mr. Charipar. Another speaker at the meeting, however, George B. Watkins of Libbey-Owens-Ford Glass Company, de-

clared that glass as manufactured today failed to meet the dependable strength properties generally required of structural materials. But he, too, foresaw that research would ultimately yield a transparent material laminated with glass which could be used as a structural member in automobile bodies.

In a special session on the "aerial jeeps," M. O. McKinney of the National Aeronautics and Space Administration, reported such a flying automobile may be feasible from stability and control standpoints in that it could be made to fly satisfactorily in both hovering and forward flight. A certain degree of artificial stabilization might be required, however, he said.

John V. Gorton of the Chrysler Corporation said the evolution of the Chrysler aerial jeep project appeared now to require accomplishment of planned research and development in these areas:

1. **Powerplant**—Although designers have succeeded in producing powerplants capable of delivering three horsepower per pound of engine, he said, some way must be found to cut their high costs.

2. **Safety**—Some method must be found to enable flying cars to land safely after engine failure.

3. **Flight Experience**—Actual flight tests are needed to back up wind tunnel and analogue computer simulations of flight performance.

Science News Letter, January 24, 1959

AERONAUTICS

Electronic Devices in Planes

► **PASSENGER**-operated hearing aids and "Dictaphone-type recorders" may be used aboard commercial airplanes without interfering with the plane's intricate instrumentation.

A special Radio Technical Commission for Aeronautics committee, set up to investigate the degree to which portable radios, recorders and similar equipment interfere with an airplane's radio receivers, is about to issue a recommendation to its member organizations that hearing aids and recorders be given clearance for airline use.

Among member organizations are the Federal Aviation Agency (formerly the Civil Aeronautics Administration), the Federal Communications Commission and the Air Transport Association of America. The RTCA's findings are submitted as recommendations, not rulings.

The recommendations on hearing aids and recorders are the only two agreed on by the committee thus far. At another meeting late in February the following problems will be considered:

1. Frequency bands that may be critical.
2. Levels of interference on these bands that can be tolerated.
3. Establishment of test procedures to de-

termine levels of radio frequency radiation of any portable device.

Passenger use of portable radios and other electrical devices has been discouraged or prohibited by most airlines ever since recent cases of interference to aircraft communications, navigation, and integrated flight instrumentation systems had been traced directly to passenger operated portable recorders and radio receivers.

Most airlines do not flatly forbid use of portable radios, but notify their flight service personnel to watch for passengers who might be using them.

Such passengers are either asked not to use them during the entire flight or during portions of the flight, or are carefully watched by the stewardess who informs the pilot of the existence of a radio on board. They do insist that such devices not be used during take-off or landing when reliance on instruments is especially important.

Pending complete investigation of this serious problem, the Federal Aviation Agency, in "Airman's Guide," published bi-monthly, has "strongly urged" that action be taken by all aircraft operators to "preclude the use of all such portable electronic devices during flight." Most airlines have heeded this warning to some extent.

In addition to finding hearing aids and recorders unobjectionable, the RTCA has found indications that FM radio receivers and radios using vibrators are especially disturbing. No conclusions in the form of recommendations governing their use have been reached as yet, however.

Science News Letter, January 24, 1959

DEMOGRAPHY

Pill Could Squelch Population Explosion

► **THE EXPLOSIVE INCREASE** in world population could be squelched by a tiny pill.

The pill may be the contraceptive tablet described in a conference on the population problem and the control of human fertility held by the American Academy of Arts and Sciences in Brookline, Mass.

The pill and related clinical evaluations were discussed by Drs. Hudson Hoagland and Gregory Pinkus, co-directors of the Worcester Foundation for Experimental Biology, and Dr. John Rock, professor emeritus at Harvard Medical School.

The pill contains recently discovered compounds called 19 nor steroids. These steroids block ovulation successfully when the pill is taken by mouth daily, the meeting was told.

Experiments in the West Indies and Puerto Rico indicate that this contraceptive pill will prevent ovulation without causing serious harmful effects. Some women have taken the pill for three years. Until the pill has been taken for a longer period, however, the exact long-range effects will remain uncertain, Dr. Hoagland said.

Currently, the pill must be taken daily. Eventually, researchers hope to be able to develop a pill with prolonged action so that fewer pills will do the job. Also, presently, the pill is relatively expensive, he pointed out. The price could be reduced considerably, he believes.

Each of the 48 states now has its own laws governing the sale of contraceptives. Eventually, this pill may be sold, without prescription, over the drug store counter, in those states that allow such purchases of contraceptives, he speculated.

Japan, in order to cut its galloping population movement, legalized abortion, Dr. Hoagland mentioned. Other countries are becoming increasingly aware of the population problems that face future generations.

Population "bombs" have created explosions in the number of people in the world.

The tremendous and dangerous increase in world population is due primarily to advances in medicine and technology. More people are simply living longer than they did a few years ago.

Antibiotics, increased interest in public health measures, and agricultural expansion have added the effects of their benefits to a rapidly growing population. Each country will become increasingly dependent on its resources to support larger numbers of people in the future, Dr. Hoagland predicted. (See p. 51.)

Even now, more than 50% of the world population is undernourished. This is particularly true of the younger age groups in underdeveloped countries.

Science News Letter, January 24, 1959

GENERAL SCIENCE

1959's Top Young Scientists

► THE TOP young scientists of 1959 have been selected.

They are 427 high school seniors in towns all across the country who have won a place in the Honors Group of the 18th Science Talent Search for the Westinghouse Science Scholarships and Awards.

Because of the increasing number of outstanding students competing, the size of the Honors Group has been enlarged this year to ten percent of the 4,274 entrants who were fully qualified to be judged.

The creative enthusiasm of these promising young scientists is evident in the research papers they submitted as part of the stiff entrance requirements.

A list of the Honors Group is being distributed. It will be sent on request accompanied by a self-addressed stamped envelope.

Like some of the world's eminent adult scientists, these young people are exploring such important frontiers as free radicals, symbolic logic, the effects of radiation, and new ways of using electronics.

A 17-year-old New Mexico boy with a yen to be an astrophysicist proposes a method to determine the altitudes of lunar features, while a Georgia boy discusses nuclear reactions in the solar interior.

Drug resistance is the special study project of a 16-year-old New York girl, and the familiar effect of fresh pineapple on the setting qualities of your gelatin salad is investigated by a girl from San Francisco.

A mature study of the sigma hyperon, a sub-atomic particle, has been done by a 16-year-old boy from Cambridge, Mass. A

delightfully written paper on the domestic and personal habits of ants is titled "Antics of the Ant" by the young Tallahassee girl who studied these insects.

The 427 members of this Honors Group range in age from 15 to 20, go to school in 265 communities in 43 states and the District of Columbia, and rank high in their high school graduating classes, with 79% of the boys and 89% of the girls in the top five percent of their classes. The rank of first, second or third in the class has been attained by at least 46% of the boys and 56% of the girls. Since the ratio of girls among the Honors Group is determined by the number of girls completing entries, 94 of these outstandingly competent pre-scientists are girls, while 333 are boys. All of them will be recommended for admission and scholarship awards to the nation's colleges and universities.

Forty of the recipients of honors will be invited to the five-day Science Talent Institute to be held in Washington Feb. 26 through March 2. During the Institute, the winners will be judged for \$34,250 in Westinghouse Science Scholarships and Awards. These winners will be listed in SCIENCE NEWS LETTER, Jan. 31.

The annual Science Talent Search is conducted by Science Clubs of America, an activity of SCIENCE SERVICE, and is supported by the Westinghouse Educational Foundation of the Westinghouse Electric Corporation.

Science News Letter, January 24, 1959



TURBINE WHEEL—This radial inflow wheel is made from Udimet 500, a superalloy, composed of heat treatable nickel-base alloy containing cobalt, molybdenum, chromium, titanium and aluminum. It is being tested at Boeing in Seattle.

GEOPHYSICS

Plot Positions Of Northern Lights

► THE POSITIONS of auroras, or northern lights, are being plotted by scientists from reports of volunteer observers scattered around the country.

The program is part of the International Geophysical Cooperation—1959, follow-up to the IGY. It is aimed at helping to chart the earth's magnetic field, which controls the pointing of a compass. This field is not at all uniform, being stronger near the poles. It is also affected by bodies of metallic ores. If the magnetic field is studied as it would be seen far from the earth, it is relatively smooth and approximates that of a simple magnet, or "dipole." Particles approaching the earth are affected by this field, whose pole is at about north latitude 79, west longitude 69.

A latitude-longitude system constructed on an axis through the center of the earth from this point gives the approximate "geomagnetic coordinates." Since stations on the same line of geomagnetic latitude see about the same number of auroras, the magnetic position of an aurora is more significant than its geographic one.

Dr. Carl W. Gartlein, head of the U. S. visual observation headquarters at Cornell University, Ithaca, N. Y., has found that plotting the observed auroral occurrence on geomagnetic coordinates does not give a simple line curve. Rather, equal aurora lines resemble "goose eggs" that cannot be simply described mathematically.

Science News Letter, January 24, 1959

MEDICINE

Alcoholics Get Care

► ALCOHOLICS are finding more community hospital doors open to them.

Hospital officials and the public alike are accepting the fact that alcoholism is a disease, not a "periodic bout with acute intoxication."

A study of New York State hospitals admitting alcoholics may point the way for other hospitals throughout the nation, said Paul F. Robinson, assistant director of the New York State Interdepartmental Health Resources Board, Albany, N. Y. Now there is evidence that tranquilizing drugs are a boon to the general hospital in quieting disturbed alcoholics and making them manageable.

The New York researchers are hopeful that hospitals which have rejected alcoholics on the basis of their being difficult to manage can accept them as patients with the same need for treatment as persons with pneumonia, heart trouble or any other disease.

Another important finding, Mr. Robinson said, was the fact that 81% of the hospitals accepting alcoholics took in persons who were sober at the time but were in need of treatment and observation.

From the financial aspect, the alcoholic patient is a good risk. Payments in full

or in part were received from 79% of those admitted to general hospitals, Mr. Robinson said. Also, almost 92% of the alcoholics admitted to voluntary general hospitals made payments before being discharged.

Results of the study, conducted by the Health Resources Board in cooperation with the Hospital Association of New York State, showed that hospitals in New York City and the "immediate metropolitan areas" had a low admission rate for alcoholics. Hospitals in the Rochester region and neighboring counties, however, had a high admission rate.

Both the American Medical Association and the American Hospital Association have issued resolutions urging community general hospitals to accept alcoholics. Details of the New York study, published in the *New York State Journal of Medicine* (Jan. 15), support their recommendations.

Dr. I. Jay Brightman, executive director of the Health Resources Board, and Charles M. Royle, of the New York Hospital Association, are co-authors of the report. In addition to Mr. Robinson, Bernard Ferber and William T. Robinson also worked on the study.

Science News Letter, January 24, 1959

ASTRONOMY

First Artificial Planet Named by Astronomers

► MECHTA, the Soviet rocket now orbiting around the sun, may be called "dream" by the Russians (Mechta means "dream" in Russian), but to astronomers it will be officially known as "Artificial Planet 1." (See SNL, Jan. 17, pp. 37 and 41.)

This word was received from Harvard College Observatory, clearing house for astronomical information in the Western Hemisphere.

Drs. G. Veis and C. Whitney of the Smithsonian Astrophysical Observatory have, however, calculated it was in the constellation of Libra on Jan. 15, based on information about Mechta's orbit supplied by the Russians.

Science News Letter, January 24, 1959

SOCIOLOGY

Desegregation Hardest Where Negroes Are Few

► DESEGREGATION of the schools is not made more difficult by a proportionately large number of Negro children, Rev. James F. Muldowney, S.J., sociologist of Wheeling College, Wheeling, W. Va., told the American Catholic Sociological Society meeting in Notre Dame, Ind.

Just about the worst climate for school desegregation, he said, is a predominantly rural area with few Negroes living in segregated sections, where the integration was forced by local court order.

The best prospect for an easy adjustment is a large city with clear residential segregation where more than a quarter of the population are Negroes and which has voluntarily accepted the Supreme Court's decision.

Academic difference between white and Negro students is not a significant factor in the ease or difficulty of transition, Father Muldowney found.

Chances are improved for a relatively easy desegregation when white teachers have become acquainted with Negro teachers in biracial professional meetings.

Overt resistance to school desegregation rarely appears among high school students without adult encouragement, Father Muldowney found.

He based his conclusion on a study of desegregation in five communities of five different states which had compulsory racial segregation before the Supreme Court decision of 1954.

Science News Letter, January 24, 1959

FISHERIES

Air Curtain Corrals Schools of Herring

► A CURTAIN of air bubbles may mean school is out when it comes to fishing for herring.

Maine fishermen have successfully used the air curtain to corral good-sized herring catches where no fish had been caught for several weeks.

Earlier trials, conducted by the U. S. Bu-

reau of Commercial Fisheries, had shown that the movements of Atlantic herring schools could be influenced by an air bubble curtain. Using equipment that consists mainly of a 1,200-foot length of flexible plastic pipe, with holes drilled at one-foot intervals and two air compressors supplying air at each end, Government researchers found they were able to herd herring right into the fishermen's waiting seines.

"It is considered significant," the researchers reported, "that the several nights of operation of this equipment resulted in the catching of a volume of herring which, valued at \$1.00 per bushel . . . were worth approximately twice the cost of the major components of the equipment. It appears quite unlikely that any of these fish could have been caught without the use of such gear."

Factors such as deep water, boat traffic, swift tides, or debris which often make it impossible to use nets and other seine gear have no effect on the use of an air curtain, they also pointed out.

Seine and air curtain sets made during six nights yielded a total of 5,350 bushels of herring, the fisheries experts reported. Aerial observations were made to determine the locations of the herring schools.

Various improvements are possible that would increase the catch, the researchers said. A 2,400- or 3,000-foot air curtain would be better in a larger number of fishing areas; a lighter curtain, one made with smaller air holes, would probably give as good "corralling" results.

Science News Letter, January 24, 1959

ENGINEERING

Direct Dialing of Office Extensions Now Routine

► IT IS now possible for an outside caller to dial directly the extension he wants in the huge headquarters office of E. I. du Pont de Nemours & Co., Inc.

America's third exchange for direct dialing to a specific desk has been installed at Wilmington, Del. Others are in American Telephone and Telegraph Company's main New York offices and at the Boeing Airplane Company offices, Seattle, Wash.

Under the new "Direct Inward Dialing" system, a company is assigned an exchange, such as LIberty 4. To reach a specific party, the caller dials LI 4, followed by the extension number.

If the calling party does not know the extension number, he still can call the main switchboard by dialing the company's number listed in the telephone directory.

Long distance calls placed under the new system will be billed at usual station-to-station rates, an A.T.&T. official said, although such calls specifying an extension number would have been billed at higher person-to-person rates under the former system.

He said the new system will save time and handling on calls and shorten the use of telephone circuits. Besides, he added, when the customer finds it easier to call a specific party, he will use the telephone more frequently.

Science News Letter, January 24, 1959

IN SCIENCE

ORNITHOLOGY

Southwest England Birds More Energetic Singers

► BRITISH BIRDS that come from the southwestern part of England are probably more energetic singers than their eastern cousins, D. R. Barber of Sidmouth, Devon, reports.

He kept detailed records of the chaffinches' songs for three breeding seasons, he reports in *Nature* (Jan. 10). Using thousands of individual bird's songs, the researcher computed the "song ratio"—the total singing time divided by total silent period for ten-day periods in the breeding season.

As the peak of the breeding season approached, there is also a "significant increase of the time spent by each bird in actual song," he noted.

Birds from Cambridge, in eastern England, sang for 2.3 seconds on the average with a 15-second rest period. In contrast, birds from Sidmouth, in the southwest, sang for 2.1 seconds with only an 8.2-second rest period.

"These results suggest that significant differences in the level of breeding song activity may well exist between bird populations in different parts of the country," the researcher concludes. The common chaffinch, *Fringilla coelebs*, was the bird studied.

Science News Letter, January 24, 1959

ENGINEERING

Robots Help Write "Personal" Notes

► A HOUSEWIFE in Bismarck, N. D., opens a letter postmarked Washington, D. C., and, wetting her thumb, runs it across the signature. The ink smears.

Then she turns the letter over and runs a practiced finger over the paper. The surface is rough with the imprint of genuine typewriting. A happy smile comes over her face as she exclaims, "Why, he sent me a personal letter!"

This scene, repeated thousands of times every week across the nation, is the end product of machines gaining wide use on Capitol Hill. The signature is by machine. The typing is from perforated tapes or sheets operating somewhat like the old player-piano in principle. But the result appears to be the real thing.

Robotyper Corporation of Hendersonville, N. C., estimates about 700 of its automatic typing machines are now in use by members of the Senate and House; and Friden, Inc., of San Leandro, Calif., claims upwards of 150 of its Flexowriters have been sold to lawmakers. The latter machine also embosses address plates automatically.

Science News Letter, January 24, 1959

DE FIELDS

BIOLOGY

Chromosome X in Man 3 Times Larger Than Y

►THE CHROMOSOME that helps determine sex in humans, the X chromosome, has been found to be three times larger than the Y chromosome.

Since the female has two X chromosomes while the male has one X and one Y, this may help explain some of the differences between the sexes, two geneticists report.

As a consequence of the larger size of the X chromosome, the human female cell is about four percent greater than the male in chromosome volume. Thus, the female has a "substantially richer genetic capacity," Drs. J. H. Tjio and T. T. Puck say in the *Proceedings of the National Academy of Sciences* (Dec. 1958) that this may contribute to the female's greater longevity.

Other differences, such as those in response to X-ray irradiation and the nature of malignant growths, might be explained by the sex chromosome size difference, the geneticists believe.

Drs. Tjio and Puck, respectively of the Estacion Experimental de Aula Dei, Zaragoza, Spain, and the University of Colorado Medical Center, Denver, also studied the number of chromosomes found in human cells. Further evidence was reported that the "real" somatic, or body cell, chromosome number of humans is 46. Previously it was believed to be 48.

Cells from various organs in 13 persons were analyzed and exact chromosome counts performed on almost 2,000 cells. More than 95% of these revealed 46 chromosomes, the scientists report.

They also divided the chromosomes into eight groups on the basis of size, position of the centromere and the possession of a satellite body. (The centromere is a small round body that divides the chromosome into "arms" and is believed to play the important role of "nucleolar organizer" in cell division.)

A total of 74 individuals have now been studied whose chromosome count is 46.

Science News Letter, January 24, 1959

NATURAL RESOURCES

Western U.S. Yields Major Valuable Deposits

►PARTS of western United States, only recently developed commercially, contain major deposits of minerals and chemicals valuable to our national economy.

The problem involved in exploiting our strategic western resources is the scarcity and high cost of transportation, V. E. Larson of Food Machinery and Chemical Corporation, Pocatello, Idaho, told scientists at the American Institute of Chemical Engineers meeting in Salt Lake City.

The western region, which Mr. Larson described as those states generally bordering the Rocky Mountains, holds vast deposits of oil, oil shale, natural gas and coal. There is a great abundance of limestone, phosphate-bearing rock, sulfur, salt, sand and soda ash-bearing trona.

In addition, Mr. Larson reported there are "adequate amounts" of copper, lead, zinc, iron and other metals.

The region's basic problems are the lack of transportation facilities and the long distance to market.

"Many good properties are undeveloped because it is not economically feasible to build a road or railroad into the property," he told the chemical engineers. In addition, "frequently freight costs to market are higher than the value of the ore" at the mine.

Science News Letter, January 24, 1959

PUBLIC HEALTH

Flu Vaccination Urged For Cardiac Patients

►INFLUENZA vaccination for persons with heart and blood vessel diseases was recommended by the U. S. Public Health Service and the American Heart Association.

Influenza can be a serious threat to persons with heart conditions. It is frequently a dangerous illness that may result in death, Drs. Leroy E. Burney, Surgeon General of the Public Health Service, and Francis L. Chamberlain, president of the American Heart Association, said in a joint statement.

"We urge heart patients to seek the advice of their physicians with respect to obtaining the protection that vaccination will give," they stated.

Experience has shown patients with heart or lung diseases are more susceptible to the hazards of influenza than is the general population.

Science News Letter, January 24, 1959

EDUCATION

1958 Frosh Engineering Enrollment Below 1957

►FEWER COLLEGE freshmen enrolled in engineering curriculums this past fall than at the same time in 1957.

After increasing steadily for seven years in a row, freshman engineering enrollment in colleges and universities of the United States and its outlying parts fell off sharply at the beginning of this school year, Arthur S. Flemming, Secretary of Health, Education and Welfare, reported.

First-year enrollments in engineering climbed to 78,757 in the fall of 1957. Last fall, enrollment tumbled 11% to 70,129.

Dr. Flemming called this a serious setback in a field of education vital to our national security in a period of revolutionary technological change. Total undergraduate enrollment in engineering subjects also dipped by 4.4%.

Science News Letter, January 24, 1959

VETERINARY SCIENCE

Oxygen Piped Into Ailing Animals by New Method

►A NEW METHOD of piping oxygen to sick animals has been developed by Dr. Tadeusz Kowalczyk, a University of Wisconsin veterinary scientist.

Dr. Kowalczyk discovered the method while attempting a last resort treatment of a cow with bronchial pneumonia, after drugs and antibiotics had failed. He inserted a small tube in one of the cow's nostrils and passed pure oxygen into her lungs. The animal recovered rapidly as the result of the treatment.

The veterinary scientist has used the method since with other animals with good results. Veterinarians see future use for the method in treating animals suffering from diseases ranging all the way from pneumonia and anemia to certain types of allergy and poisoning.

Previous methods of giving oxygen to animals have involved the use of masks or oxygen tents. Masks require complex equipment and, in addition to being uncomfortable, also frighten the animal. Oxygen tents are expensive, difficult to use, and their use carries an explosion hazard.

In contrast, the method developed by Dr. Kowalczyk has the advantages of safety, simplicity and ease of set-up. The only equipment necessary is an oxygen tank with pressure and low regulators and a length of flexible plastic tubing.

One end of the tube is lubricated and inserted in the animal's nostril, and the tube is then taped to the animal's nose. A flexible band suspends the tube from the animal's stall. This leaves the animal free to lie down, move about, or even eat, and still receive oxygen at the same time.

Science News Letter, January 24, 1959

PHYSIOLOGY

Polarized Light Aids Bees in Flight

►BEES AND other arthropods, spiders and lobsters among them, use the reflections from polarized light, rather than the light itself, to communicate and navigate in their hives.

This means that, contrary to scientists' expectations, they probably lack a special sensory mechanism in their eyes.

Experiments reported to the American Association for the Advancement of Science indicate that these animals "must respond to brightness of reflections and that these reflections depend on polarization." Bees that cannot see overhead light can still orient themselves to polarized light, Edward R. Baylor of the Oceanographic Institution, Woods Hole, Mass., said.

However, when the lower part of a bee's eyes are painted over with a shellac-like substance so that it cannot see reflected light, the bee is unable to orient herself. Prof. Frederick E. Smith of the University of Michigan worked on the experiment with Mr. Baylor.

Science News Letter, January 24, 1959

ASTRONOMY

Venus Brightens

Mars will fade in February skies as it travels farther from the earth. Meanwhile, the planet Venus can be seen in the southwest until about two hours after sunset.

By JAMES STOKLEY

► MARS is drawing farther away and rapidly fading. Now Venus is increasingly prominent. It can be seen low in the southwest on February evenings until about two hours after sunset.

It is in the direction of the constellation of Aquarius, the water carrier. This, however, is a rather inconspicuous group of stars that will be much harder to see than Venus itself. During February, Venus shines with a brilliance about 20 times that of a typical first magnitude star, such as Pollux, seen high in the south in Gemini, the twins. Thus, there is no difficulty in locating Venus, if the southwestern sky is clear.

Venus is not shown on the accompanying maps, as these depict the sky at a later hour: 10:00 p.m., your own standard time, at the first of February, 9:00 p.m., at the middle of the month and 8:00 p.m. at the end. Mars appears on them, however, as it is in Taurus, the bull, high in the southwest. It stands just to the left of the little cluster of fainter stars called the Pleiades. These are sometimes called the "seven sisters," although it takes a keen eye to see more than six without some sort of optical aid, such as a telescope, or binoculars.

Mars, at the middle of February, will be about 75% brighter than Pollux, but this is less than one-tenth of what it was last November, when it made an unusually close approach to the earth.

Sirius is Brighter

Even brighter, however, is the star called Sirius. This is the "dog-star," in Canis Major, the great dog, in the south. Directly above this group is the faint constellation of Monoceros, the unicorn. Canis Minor, the lesser dog, is just above that; in it is another first-magnitude star, Procyon. Going upwards another step, is Gemini, in which Pollux stands. Castor, the other twin, is represented by the fainter star (which is second magnitude) a little above and to the right.

Taurus, which is the present location of Mars, is shown high in the southwest. It also contains a star of the first magnitude, Aldebaran, the eye of the bull. Above this is Auriga, the charioteer. Capella is the name of its bright star. On the maps, Auriga is divided; part of it appears on the southern map and the rest, with Capella, on the northern.

Orion, the warrior, the most brilliant of all the constellations, is between Taurus and Canis Major. It is the only star group to contain two first magnitude stars. One is Betelgeuse, above, and Rigel, below. Between these is a row of three stars, each a

little fainter, which form Orion's belt. This feature makes it rather easy to identify.

Leo, the lion, is high in the east. In it is another bright star, Regulus. Left of Leo, is the well-known great dipper, which is part of Ursa Major, the great bear. Ursa Minor, the lesser bear, is still farther to the left, directly north. One member of this group is Polaris, the pole star, which is overhead at the north pole of the earth.

Although Venus and Mars are the only planets presently visible to the naked eye in the evening, two others appear after midnight. The first, rising in the east about 2:00 a.m., is Jupiter, in Scorpius, the scorpion. While only about one-fifth as bright as Venus, it is many times brighter than any other planet, or any star. A few hours later it is followed by Saturn, which is in Sagittarius, the archer. This planet is now about the same brightness as Mars. Mercury will not be visible at all during February, for it is too nearly in the same direction as the sun. In fact, it passes behind the sun on St. Valentine's day. The astronomer calls this "superior conjunction."

With rockets being fired at earth's one natural satellite—the moon—that body has been attracting a lot of attention in recent months. In the past, the moon has been

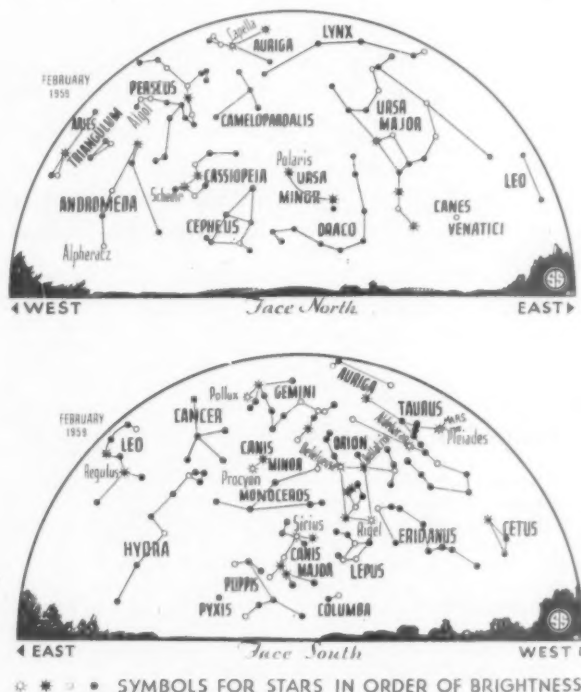
largely neglected by professional astronomers, who have been more interested in studying the far more distant stars and galaxies. But now, as the time when men may actually be placed there draws closer, some large telescopes have been turned on it, and new data are being collected.

One of the most striking recent developments has been the discovery, by a Russian astronomer, Dr. N. A. Kozyrev of the Crimean Astrophysical Observatory, of what appears to be an active volcano on the moon.

Moon Volcano

He used a reflecting telescope, like those at Mt. Wilson and Mt. Palomar in California. Unlike the more familiar reflector, where a lens focuses the light rays from the distant object on a photographic film, or into an eyepiece through which the observer looks, this uses a dish mirror to perform the same function. This mirror, at the Russian observatory, is 50 inches in diameter, although only a quarter of the diameter of the "big eye" at Palomar, the largest in the world.

As described recently in a British weekly, *The New Scientist*, by Dr. Zdenek Kopal of the University of Manchester, it was in the early morning hours of Nov. 4, 1958, with the moon two days before the phase of last quarter, that Dr. Kozyrev was studying the region of the lunar crater called Alphonsus. There is a prominent



★ ★ ★ ★ SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

peak 80 miles wide in the center of this circular mountain. He was watching this intently to keep the telescope accurately pointed for 30 minutes, from 2:30 to 3:00, while he made a spectroscopic exposure. The light from the region being examined passes through a narrow slit, then through a combination of lenses and prisms. The result is a spectrum, which shows the distribution of light of various wavelengths. Ordinarily, the light from the moon shows a spectrum similar to that of the light from the sun, and crossed by similar dark lines. The light of the moon is reflected sunlight.

But, as Dr. Kozyrev watched the central peak of Alphonsus, he noticed that it became unaccountably blurred by some sort of reddish cloud. The spectrogram, when he developed the plate, was very different from what he expected. Instead of the series of well-defined lines, each due to some element in the sun's atmosphere that normally appear, there was a series of bands, called Swan bands, that showed the presence of carbon atoms, paired to form molecules. These do not appear in the sun. Another spectrogram, made between 3:00 and 3:30 a.m., showed only the customary lines.

It seems, according to Dr. Kopal, that these carbon molecules, that appeared so briefly over the central peak, were produced in some way by the breakdown of more complicated molecules. This requires considerably more heat than that of the sun's rays. There must have been some source of heat nearby, perhaps under the lunar surface, just before the appearance of the cloud Dr. Kozyrev observed.

This, of course, was very similar to a volcanic eruption on the earth, so it is the first good evidence that there is some such activity on the moon. Perhaps it is not the completely dead world that many have assumed it to be.

Scientists are eagerly awaiting the time when, with more and better rockets, they can make closeup observations. Then they may find the answers to some of their questions.

Celestial Time Table for February

Feb. EST

1	2:56 a.m.	Algol (variable star in Perseus) at minimum brightness.
	7:32 p.m.	Moon passes Jupiter.
3	11:45 p.m.	Algol at minimum.
4	7:13 a.m.	Moon passes Saturn.
6	8:35 p.m.	Algol at minimum.
7	2:22 p.m.	New moon.
9	5:24 p.m.	Algol at minimum.
13	midnight	Mercury on opposite side of sun from earth.
14	9:00 a.m.	Moon farthest, distance 251,300 miles.
15	2:20 p.m.	Moon in first quarter.
16	12:19 p.m.	Moon passes Mars.
23	3:54 a.m.	Full moon.
24	1:31 a.m.	Algol at minimum.
26	5:00 a.m.	Moon nearest, distance 227,400 miles.
	10:20 p.m.	Algol at minimum.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, January 24, 1959

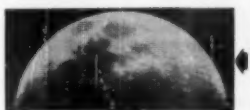
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THE ASTRONOMER'S UNIVERSE—Bart J. Bok—Cambridge Univ. Press, 197 p., illus., \$3.75. Summarizes recent developments in the field of astronomy for the benefit of the intelligent and inquiring layman.

THE AUTOBIOGRAPHY OF CHARLES DARWIN 1809-1882—Nora Barlow, Ed.—Harcourt, 253 p., illus., \$4.50. First unexpurgated edition with original omissions restored, edited with Appendix and Notes by his grand-daughter.

THE BIRTH OF NORMAL BABIES—Lyon P. Strean—Twain, 194 p., \$3.95. Case histories in support of the author's research findings that most congenital abnormalities are not hereditary but due to stress.

ELECTRICITY IN AIRCRAFT—F. G. Spreadbury—Macmillan, 342 p., illus., \$8. Deals mainly with aircraft electrical equipment after 1945; for electrical engineers and technicians.

EMBRYONIC NUTRITION—Dorothea Rudnick, Ed.—Univ. of Calif. Press, 113 p., illus., \$3.25. Symposium of one of the Developmental Biology Conference Series which took place in 1956, under the auspices of the National Academy of Sciences-National Research Council.

ENCOURAGING FUTURE SCIENTISTS: Student Projects—John H. Woodburn—National Science Teachers Assn., rev. ed., 23 p., illus., paper, 50¢. Helpful to science students who want to do a science project.

THE GENETICAL THEORY OF NATURAL SELECTION—R. A. Fisher—Dover, rev. ed., 291 p., illus., paper, \$1.85. An examination of Darwinism and natural selection in the light of modern genetics. First published in 1929.

GUIDE TO THE LITERATURE OF MATHEMATICS AND PHYSICS: Including Related Works on Engineering Science—Nathan Grier Parke III—Dover, 2nd rev. ed., 436 p., paper, \$2.49. Of greatest use to those who use mathematics.

MATHEMATICS FOR INDUSTRY—S. E. Rusinoff—Am. Technical Soc., rev. ed., 565 p., illus.,

\$6.25. Presents in simplified form the mathematics most often needed in the field of practical engineering.

MENTAL SUBNORMALITY: Biological, Psychological and Cultural Factors—Richard L. Masland, Seymour B. Sarason and Thomas Gladwin—Basic Bks, 442 p., \$6.75. A survey of research sponsored by the National Association for Retarded Children.

THE NATIVE BROTHERHOODS: Modern Intertribal Organizations on the Northwest Coast—Philip Drucker—Smithsonian Inst. (Govt. Printing Office), 194 p., paper, \$1. A study in acculturation of the Alaskan and British Columbian Indians.

A NATURAL HISTORY OF INHACA ISLAND, MOZAMBIQUE—William Macnair and Margaret Kalk, Eds.—Daub, 163 p., illus., \$7.50. Handbook dealing with the animals and plants of the tropical east African shore.

NOTHING LIKE SCIENCE—Magnus Pyke—St. Martins, 172 p., illus., by Michael Ffolkes, \$4. A British scientist looks at our science of today and demonstrates that some of the things attributed to it are often "nothing like science."

ORQUIDEAS DE MEXICO—N. Pelham Wright—Editorial Fournier, S. A. (Science Service), 23 p., text, 40 colored plates, \$10. In Spanish and English. Of interest to horticulturists and all orchid enthusiasts.

PAPERS ON THE SOLAR CONSTANT—Theodore E. Sterne and others—Smithsonian Inst. (Govt. Printing Office). Smithsonian Contributions to Astrophysics, Vol. 3, No. 3, 24 p., paper, 20¢.

THE PRACTICAL DICTIONARY OF ELECTRICITY AND ELECTRONICS—R. L. Oldfield—Am. Technical Soc., 216 p., illus., \$5.95. Includes handbook of formulas, tables, diagrams and graphical symbols.

PROCEEDINGS OF LUNAR AND PLANETARY EXPLORATION COLLOQUIUM—B. B. Chew and others—North Am. Aviation, Missile Division, 23 p., illus., free upon request direct to publisher, 5601 Imperial Highway, Los Angeles, Calif.

PROJECT VANGUARD REPORT NO. 31: The Vanguard Sequence Diagram, a Graphical Method of Presenting Complex System Opera-

tion—W. J. D. Escher and R. W. Foster—Naval Res. Lab. (Office of Technical Services), 15 p., illus., 75¢. Includes master sequence diagram.

THE PROPERTIES AND STRUCTURE OF MATTER: Part I—Lewis Pokras—Macmillan, 580 p., illus., paper, \$5. Experimental college textbook of fundamental chemistry with stress on more independent study by the student.

RIVERS IN THE DESERT: A History of the Negev—Nelson Glueck—Farar, Straus, 302 p., illus., \$6.50. Archaeological exploration of the southern half of Israel, the site of trade routes and civilizations since the 4th millennium B.C.

SCALE-UP IN PRACTICE—Richard Fleming, Ed.—Reinhold, 134 p., \$4.50. Based on an "Experience in Industry" symposium jointly sponsored by Philadelphia-Wilmington Section of the American Institute of Chemical Engineers and the University of Pennsylvania.

THE SOCIAL IMPACT OF BOMB DESTRUCTION—Fred Charles Iklé—Univ. of Okla. Press, 250 p., illus., \$3.95. Findings of the effects of bombing on the functioning of society, based on extensive analysis of World War II data from Germany, Japan, Poland, and other countries.

STELLAR POPULATIONS—D. J. K. O'Connell, Ed.—Interscience, 544 p., illus., \$10. Proceedings of the Conference sponsored by the Pontifical Academy of Science and the Vatican Observatory, 1957.

THE STORY OF THE DINOSAURS: A Guidebook for Young Scientists—Stanley B. Brown and Barbara M. Brown, reviewed for scientific accuracy by Mary B. Patsuris—Harvey House, 125 p., illus., by Don Bolognese, \$2.95. Accurate information in simple language abundantly illustrated.

STUDIES ON THE STRUCTURE AND DEVELOPMENT OF VERTEBRATES. Vols. I and II—Edwin S. Goodrich—Dover, 837 p., illus., 2 vols., paper \$5. Unabridged reprint of original one-volume edition published in 1930.

A SYMPOSIUM ON THE CHEMICAL BASIS OF DEVELOPMENT—William D. McElroy and Bentley Glass, Eds.—John Hopkins Press, 934 p., illus., \$15. Papers on developmental cytology, cellular and tissue interactions in development, problems of specificity in growth and development and on control mechanism in development.

SYNTHETIC METHODS OF ORGANIC CHEMISTRY: Yearbook Vol. XII—W. Theilheimer—Interscience, 546 p., \$22.50. Reports on new trends in the synthesis of organic compounds and improvements of known methods published between 1955 and 1957. Includes German Register-Schlüssel of volumes I-XII.

A TEXT-BOOK OF ORGANIC CHEMISTRY: Historical, Structural & Economic—John Read and F. D. Gunstone—Bell, G., 4th rev. ed., 610 p., illus., \$5.25. Includes discussions of modern theories of organic chemical structure, reactivity and reaction mechanism.

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WATER: Riches of Ruin—Helen Bauer—*Doubleday*, 121 p., illus., \$3. Written for young people impressing them with the need for conservation of the most important natural resource—water.

Science News Letter, January 24, 1959

Questions

ASTRONOMY—What is the scientific name for Mecha? p. 56.

GENERAL SCIENCE—How many students qualified to be judged in this year's science talent search? p. 55.

GEOPHYSICS—What type of curve is formed by plotting the observed auroral occurrence on geomagnetic coordinates? p. 55.

Photographs: Cover, Yankee Atomic Electrical Engineering Company; p. 51, Bell Telephone Laboratories; p. 53, Gardner-Denver Company; p. 55, Boeing Airplane Company; p. 64, Corning Glass Company.

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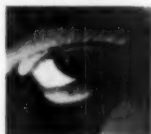
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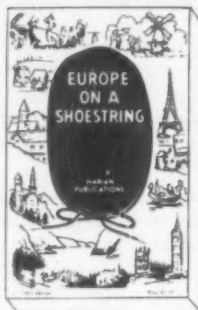
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Are You Going to the West Indies? BERMUDA? NASSAU?

NOW, with the help of William Redgrave's huge new book *Islands in the Wind*, you can have your West Indies vacation—see it all, do it all—yet spend no more than would a long-time resident of the islands who knows "all the ropes."

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Islands in the Wind covers every single island of importance from Bermuda way down to Trinidad, that incredible British colony where the calypso was born, Indian mosques pierce the sky, and brown women from Malaya wear flowered sarongs. This big book gives you the information you want about Nassau, Cuba, the free ports in the Virgin Islands, Jamaica, the British, Dutch, and French West Indies.

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On past trips we've all missed something we now regret not having known about. Don't let that happen again. William Redgrave's big book ALL OF NEW ENGLAND will help you find everything worth seeing in these history-filled, scenic states.

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HOW TO TRAVEL—And Get Paid For It

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Of course the book is complete with names and addresses, and with full details about all the preparations you must make. You learn which countries to head for, the cautions to observe, even where it's perfectly possible to write from your own home for a job overseas.

"Can a man or woman still work his or her way around the world today?" Norman Ford asks in this book, as you might ask today. And he replies in 75,000 words of facts, "The answer is still a very definite Yes!" Price \$1.50.

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- ☐ Islands in the Wind (the guide to Bermuda, Nassau, and the West Indies). \$2.50.
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• New Machines and Gadgets •

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✿ **TRUCK WHEEL CLEATS** are designed to get double-wheeled trucks out of the mire. Fitting all standard dual wheels, the cleats are firmly held in place by a reinforced nylon bag which is slipped between the tires. The bag is inflated through a hose which taps the air supply in one tire, reducing its pressure by only two pounds.

Science News Letter, January 24, 1959

✿ **INK SOLVENT** is a powdered soap with cold cream base for use in print shops, offices, manufacturing plants and schools. The soap safely and quickly "cuts" ink from the hands. Cost accountants report wash-up time is sharply reduced.

Science News Letter, January 24, 1959

✿ **CITIZENS' RADIO** for two-way voice transmission over a distance of several miles operates on band frequencies set aside by the Federal Communications Commission for personal conversation. Weighing less than 10 pounds, it works on a six-volt or 12-volt battery, or standard 115-volt a.c. power.

Science News Letter, January 24, 1959

✿ **HEATED OUTSIDE MIRROR** for trucks, tractor trailers, buses and cars will melt a quarter inch of ice in 10 minutes at 60 below zero. The rear-view mirror, shown



in the photograph, has an electrically conductive coating on its back for heating, and a surface coating on its front for non-glare reflection. A high-low-off dashboard switch controls the heating rate.

Science News Letter, January 24, 1959

✿ **FOLDABLE BOAT** is built of marine plywood with leak-proof joints and seams. It folds flat for storage on walls or rafters and can be carried flat on top of any car.

Unloading takes five minutes or less. A metal transom brace is strong enough to lift the entire boat.

Science News Letter, January 24, 1959

✿ **LAMP REFLECTOR** has built-in vents to force a moving stream of air through it. This affords cooler operation and longer lamp life while keeping the reflector free of dust and grime. The reflector is made in various shapes of porcelain-bonded steel.

Science News Letter, January 24, 1959

✿ **PLASTIC RUBBER ADHESIVE** in dry bar form leaves a thin pressure-sensitive coating that is not sticky to the touch. Paper sticks instantly, yet can be picked up and moved many times. The cement bonds tight at the edges without oozing, and will not stain, wrinkle or shrink the paper. Also, it is odorless, non-inflammable, non-toxic and never spoils.

Science News Letter, January 24, 1959

✿ **TOOL HOUSE** of heavy gauge steel is easily and quickly assembled and dismantled. Side and rear panels are horizontally ribbed for added strength. Seven feet wide and seven feet deep, the utility house has a rolling, garage-type overhead door gliding on free-turning rollers.

Science News Letter, January 24, 1959



Nature Ramblings



By BENITA TALL

► **THE EMPTY-HANDED** fisherman who returns with long recitals of the "one that got away" is undoubtedly convinced that fishes think.

The trout's trickery in eluding the hook, yet taking the bait and escaping with the prize, is certainly an example of intelligence, says the fisherman. And given the opportunity he will continue with stories about the Old One at Mirror Lake that has been around for years despite all efforts of the best fishermen in the neighborhood.

The fact that many fish in the wild become wary and consistently escape capture seems to be evidence of intelligence. The salmon's ability to make his way upstream to spawn, navigating "steps" and weirs, is regarded by some as an example of learning. Experiments in tanks, artificial ponds and aquariums also indicate fishes have a memory for their home site.

The Brainy Fishes



Even altering a fish's home by changing the lighting, plant arrangements or the aquarium bed, did not make one trout change its position.

The ability of the young eel to find its way from the ocean where it was spawned to the river or pond its parents had left is believed to be further evidence of possibly intelligent behavior.

The known and tested ability of some fishes to distinguish among various sounds and shapes certainly indicates keen observation if not intelligence!

Many tropical fish fanciers believe the cichlids, colorful, spiny-finned fishes that carry their eggs in their mouths or pharynx until they hatch, have mental development akin to intelligence. They are emotional and selective. Numerous stories are told of their ability to learn from just one experience.

With all the research and tests attempting to measure animals' or fishes' intelligence, few scientists would attempt the work of some French researchers. They categorized fish on the basis of intelligence. A partial listing goes like this: intelligent, carp; fairly intelligent, chub, roach and trout; not very intelligent, bream; definitely stupid, eel, pike, perch, minnow and catfish.

Science News Letter, January 24, 1959

